

Review 9 Mean Value Theorem for derivatives

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

secant || tangent

inst rate = ave rate
for c in (a, b)

f must be: continuous on $[a, b]$
differentiable on (a, b)

Ex 1. $f(x) = x + \ln x$ Find the value of x
where the inst. rate = ave rate on $[1, 4]$

$$f'(x) = 1 + \frac{1}{x} = \frac{(4 + \ln 4) - (1 + \ln 1)}{4 - 1}$$

$$x = 2.164$$

Feb 27-9:10 AM

Feb 27-9:18 AM

Ex 2

x	0	1	2	3	4
$f(x)$	2	3	4	3	2

f is continuous & differentiable on $[0, 4]$
which of the following must be true?

- A) the min value of f on $[0, 4]$ is 2
- B) the max value of f on $[0, 4]$ is 4
- C) $f(x) > 0$ for $0 < x < 4$
- D) $f'(x) < 0$ for $2 < x < 4$
- E) $f'(x) = 0$ for some x on $(0, 4)$

$$\frac{f(4) - f(0)}{4 - 0} = \frac{2 - 2}{4} = 0$$

MVT dudes

Feb 27-9:25 AM